

REMARKS

Upon entry of the above-identified amendment, claims 13, 14, 16, 18, 23-25 and 28-32 will be pending, wherein claims 20 will be canceled, and claims 13, 16, 23, and 28 will be amended. Applicant respectfully requests favorable reconsideration and entry of the above-identified amendments in view of the remarks presented herein below.

In paragraph 2 of the Office Action (“Action”), the Examiner rejects claims 13, 14, 16, 18, 20, 23-25 and 31 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. Applicant respectfully traverses this rejection.

The Examiner asserts that claims 13, 14, 16, 18, 20 and 23-25 are indefinite because it is not clear wherefrom and whereto the substrate should be transferred. Upon entry of the above-identified amendment, claims 13 and 23 will be amended to remove said limitation, thereby addressing the Examiner’s concerns.

The Examiner asserts that claims 23-25 are indefinite because it is not clear what manipulative steps are required. Again, upon entry of the above-identified amendment, the Examiner’s concerns will be addressed. More specifically, claim 23 will be amended to more clearly definite the manipulative steps required.

Finally, the Examiner asserts that claim 31 is indefinite because it is not clear how the brushes are exposed to ultrasonic energy. In response, Applicant notes that claim 31 does *not* recite that the brushes are exposed to ultrasonic energy, but rather that the brushed side surface of the substrate is exposed to ultrasonic energy. Furthermore, one skilled in the art would readily appreciate how said limitation is achieved in view of the specification, for page 7, lines 5-11.

For at least those reasons presented above, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 13, 14, 16, 18, 23-25 and 31 under 35 U.S.C. 112, second paragraph.

In paragraph 4 of the Action, the Examiner rejects claims 23-25 under 35 U.S.C. 112, first paragraph, as allegedly failing to comply with the written description requirement. More specifically, the Examiner asserts that the concept of cleaning the side surfaces and the lower and upper surfaces of a substrate with the same cleaning module is not recited in the original disclosure. Applicants respectfully traverse this rejection.

The specification, specifically page 6, lines 10-13 and Fig. 2, clearly discloses that the cleaning module comprises sides brushes for cleaning the side surface of the substrate and upper

and lower brushes for cleaning the upper and lower surfaces of the substrate respectively. Therefore, the rejection of claims 23-25 under 35 U.S.C. 112, first paragraph is improper for at least the reason that the claimed subject matter is provided in the specification. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 23-25 under 35 U.S.C. 112, first paragraph.

In paragraph 5 of the Action, the Examiner rejects claims 28-32 under 35 U.S.C. 112, first paragraph, because the specification allegedly does not reasonably provide enablement for any substrate having the recited surfaces. Applicant respectfully traverses this rejection.

One skilled in the art would readily appreciate that the cleaning method of the present invention could be applied to any substrate having the recited surfaces. The fact that the specification specifically discloses an LCD substrate does not result in the claimed cleaning method being unsuitable for other substrates. To the contrary, the specification clearly teaches one skilled in the art how to make and use the claimed invention without undue experimentation. Furthermore, should the Examiner maintain this rejection, Applicant respectfully requests that the Examiner provide an explanation as to why the scope of protection provided by claims 28-32 is not adequately enabled by the disclosure, specifically, why one skilled in the art would require undue experimentation to apply the disclosed invention to *any* substrate which comprises the claimed surface as opposed to only LCD substrates. Finally, Applicant notes that the Examiner asserts that one skilled in the art would require undue experimentation to apply the disclosed method to substrates other than LCD substrate, yet the Examiner asserts that it would have been obvious to modify the prior art techniques, which are applied to wafers, to LCD devices. Accordingly, the Examiner is inconsistent in his assertions. First he asserts that one skilled in the art would not have applied LCD cleaning methods to non LCD substrates, then he asserts that it would have been obvious to one skilled in the art to apply non LCD substrate cleaning methods to LCD substrates. For at least those reasons presented above, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 28-32 under 35 U.S.C. 112, first paragraph.

In paragraph 8 of the Action, the Examiner rejects claims 13, 14, 16, 18, 20, 23-25 and 28-32 under 35 U.S.C. §103(a) as allegedly being unpatentable over any one of U.S. Patent No. 5,901,399 to Moinpour et al. (“Moinpour”) and U.S. Patent No. 5,937,469 to Culkins et al. (“Culkins”) in view of U.S. Patent No. 6,059,891 to Kubota et al. (“Kubota”) and U. S. Patent No. 5,868,866 to Maekawa et al. (“Maekawa”). Applicant respectfully traverses this rejection.

In order to support rejection under 35 U.S.C. §103(a), the Examiner must establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, three basic criteria must be met. First there must be some motivation or suggestion to modify/combine the applied references. Second, there must be a reasonable expectation of success. Finally, the combination must teach each and every claimed element. In the present case, claims 13, 14, 16, 18, 20, 23-25 and 28-32 are not rendered unpatentable over the combination of Moinpour, Culkins, Kubota and Maekawa because the Examiner fails to establish a *prima facie* case of obviousness as discussed below.

Independent claim 13, upon entry of the above-identified amendment, defines a method of cleaning a substrate of a liquid crystal display panel. The method includes, *inter alia*, jetting deionized water that carries ultrasonic waves onto the side surface of the substrate, brushing the side surface with a brush that extends partially along the side of the substrate, and cleaning an upper and lower surface of the substrate. Independent claim 23, like claim 13, defines a method of cleaning a substrate that includes jetting deionized water that carries ultrasonic waves onto the side surface of the substrate.

The Examiner asserts that Kubota discloses that “ultrasonic spraying, brushes and jet spraying are conventionally used for the same purpose and can be used one instead of another.” Therefore, the Examiner concludes that it would have been obvious to one skilled in the art to “provide in the methods of Moinpour et al and Culkins et al in addition or instead of one of the jet spraying means or one of the plurality of side brushes an ultrasonic spraying means in order to enhance the cleaning.” To support these assertions the Examiner points to column 2, lines 1-8 of Kubota. These assertions are unfounded for the following reasons.

First, Kubota does *not* disclose that ultrasonic spraying, brushes and jet spraying are *conventionally* used for the same purposes. To the contrary, Kubota only discloses that the washing means used in the invention of Kubota is not limited to a brush, but could also be an ultrasonic washer or a water jet washer. The fact that the washing means of Kubota can be any of the three devices is not equivalent to disclosing that the three devices are *conventionally* interchangeable. Second, the Examiner asserts that one skilled in the art would be motivated to replace the disclosed brushes or jet spraying means of Moinpour or Culkins with an ultrasonic spraying means in order to enhance the cleaning, however the Examiner also asserts that the devices are interchangeable, implying that there is no advantage to one or the other. Therefore, if the devices are truly interchangeable why would one skilled in the be motivated to change the

systems of Moinpour or Culkins to achieve functionality which is achieved without change? Accordingly, absent proper motivation to modify the systems of Moinpour or Culkins the rejection of claims 13 and 23 is improper.

Furthermore, even if one skilled in the art were motivated to combine Moinpour or Culkins with Kubota and Maekawa (which Applicant does not concede), the combination(s) would still fail to render claims 13 and 23 unpatentable for at least the reason that the combination fails to disclose each and every claimed element.

Nowhere in Moinpour, Culkins, Kubota or Maekawa is there any disclosure or suggestion of jetting water that carries ultrasonic waves on a *side surface* of the substrate as claimed. At best Kubota discloses that a ultrasonic washer can be used to apply water to the upper surface of a wafer. Since neither Moinpour, Culkins, Kubota nor Maekawa disclose jetting water that carries ultrasonic waves on a side surface of a substrate, any combination of these four reference cannot possibly disclose or suggest each feature. Therefore, even if one skilled in the art were motivated to combine these references the combination would still fail to render claims 13 and 23 unpatentable.

Independent claim 28 defines a method of cleaning a substrate having an upper surface and a lower surface separated by at least two opposing side surfaces. The method includes, *inter alia*, brushing at least two opposing side surfaces, cleaning at least one of the upper and lower surfaces, and spraying water that carries ultrasonic waves onto the at least two brushed side surfaces.

Independent claim 28 is patentably distinguishable over any combination of Moinpour, Culkins, Kubota and Maekawa for at least the reason that none of the reference, alone or in combination, disclose or suggest brushing at least two opposing side surfaces and spraying water that carries ultrasonic waves onto the at least two brushed side surfaces as claimed. Therefore, even if one skilled in the art were motivated to combine Moinpour, Culkins, Kubota and Maekawa, the combination(s) would still fail to render claim 28 unpatentable for at least the reason that the combination fails to disclose each and every claimed element.

Claims 14, 16, 18, 24, 25 and 29-32 variously depend from claims 13, 23 and 28. Therefore, claims 14, 16, 18, 24, 25 and 29-32 are patentably distinguishable over any combination of Moinpour, Culkins, Kubota and Maekawa for at least those reasons presented above with respect to claims 13, 23 and 28. Accordingly, Applicant respectfully requests entry

of the above-identified amendment and withdrawal of the rejection of claims 13, 14, 16, 18, 23-25 and 28-32 under 35 U.S.C. §103(a).

The application is in condition for allowance. Notice of same is earnestly solicited. Should the Examiner find the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

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